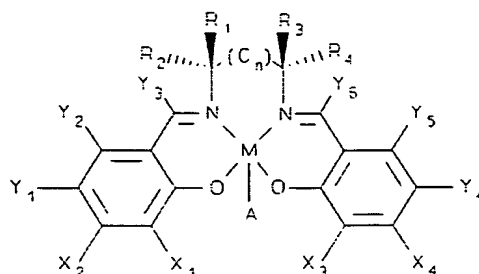


CLAIMS

1. A salen-metal compound having detectable antioxidant activity and according to the structural formula:



wherein M is selected from the group consisting of Mn, Co, Cu, Fe, V, Cr, and Ni;

A is an axial ligand selected from the group Cl, F, O, Br, (or) acetyl;

n is either 0, 1, or 2;

X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> and X<sub>4</sub> are independently selected from the group consisting of hydrogen, lower alkoxys, halides, and aryloxys;

Y<sub>1</sub>, Y<sub>2</sub>, Y<sub>3</sub>, Y<sub>4</sub>, Y<sub>5</sub>, and Y<sub>6</sub> are independently selected from the group consisting of hydrogen, lower alkoxys, aryloxys, and halide; and

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, aryl, substituted aryl, heteroatom-bearing aromatic groups, arylalkyls, lower alkoxys, and halides; with the proviso that one of R<sub>1</sub> or R<sub>2</sub> may be covalently linked to one of R<sub>3</sub> or R<sub>4</sub> forming a cyclic structure.

2. A salen-metal compound of claim 1 having a structural formula selected from the group of compounds consisting of: C31, C32, C33, C34, C35, C36, C37, C38, C39, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76,

C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, and C94 as shown in Fig. 12<sup>(A,B)</sup>, Fig. 19A and Figs. 11<sup>(A,B)</sup>, 23<sup>(A,B)</sup>, 24A-24I, and 26A-26E.

*does not show compounds* *does not show claimed compounds*

3. A salen-metal compound of claim 1 having a structural formula selected from the group of compounds consisting of: C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C54, C55, C56, C58, C67, C68, C71, C72, C73, C74, C76, C79, C80, C81, C82, C83, C84, C85, C86, and C87.

4. A salen-metal compound of claim 1 having a structural formula according to Structure X, Structure XI, Structure XII, Structure XIV, Structure XV, Structure XVI, Structure XVII, Structure XVIII, Structure XX, or Structure XXII as shown in Figs. 26A-26E, with the allowed substituents as described for each Structure.

5. A salen-metal compound having detectable antioxidant activity and selected from the group consisting of: C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C54, C55, C56, C58, C67, C68, C71, C72, C73, C74, C76, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, or C94.

6. A salen-metal compound of claim 5, selected from C32, C40, and C81.

7. A salen-metal compound of claim 1, wherein at least two of  $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$ ,  $Y_1$  and  $Y_4$  is methoxy or halide.

8. A salen-metal compound of claim 1, wherein  $n$  is 0 and wherein one of  $R_1$  or  $R_2$  is covalently linked to one of  $R_3$  or  $R_4$  forming a six-membered ring.

9. A salen-metal compound of claim 8, wherein the six-membered ring is a benzene ring or a pyridine ring.

10. A salen-metal complex having antioxidant activity and having a structure according to the structural formula shown in Fig. 11, <sup>(A)</sup>

wherein M is selected from the group consisting of Mn, Co, Cu, Fe, V, Cr, and Ni;

A is an axial ligand selected from the group Cl, F, O, Br, or acetyl;

X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> and X<sub>4</sub> are independently selected from the group consisting of hydrogen, lower alkoxys, halides, and aryloxys;

Y<sub>1</sub>, Y<sub>2</sub>, Y<sub>3</sub>, Y<sub>4</sub>, Y<sub>5</sub>, and Y<sub>6</sub> are independently selected from the group consisting of hydrogen, lower alkoxys, aryloxys, and halide; and

R is selected from the group consisting of: 1,2-ethane diyl; 1,2-benzenediyl; 2,3-pyridine diyl; (2-hydroxy)-2,3-propane diyl; 1,2-ethene diyl; 1,2-epoxy ethane diyl; alkaylene diyl; and cyclohexane diyl; wherein members of said group are substituted or unsubstituted.

11. A salen-metal complex of claim 10, wherein R is a structure having a planar conformation.

12. A pharmaceutically acceptable composition comprising an excipient or carrier and a salen metal compound having detectable antioxidant activity and according to Structure X, Structure XI, Structure XII, Structure XIV, Structure XV, Structure XVI, Structure XVII, Structure XVIII, Structure XX, or Structure XXII as shown in Figs. 26A-26E, or according to Fig. 11, with the allowed substituents as described for each Structure.

13. A pharmaceutically acceptable composition of claim 10, wherein the salen-metal compound is selected from the group consisting of: C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C54, C55, C56, C58, C67, C68, C71, C72, C73, C74, C76, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89,

does not reflect the claimed structures

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C90, C91, C92, C93, and C94.

14. A pharmaceutically acceptable composition of claim 10, wherein the salen-metal compound is C32, C40, or C81.

15. A salen-metal compound of claim 1 ~~or claim 10~~ having detectable superoxide dismutase activity.

16. A salen-metal compound of claim 1 ~~or claim 10~~ having detectable catalase activity.

17. A salen-metal compound of claim 1 ~~or claim 10~~ having detectable peroxidase activity.

18. A salen-metal compound of claim 1 ~~or claim 10~~ having detectable superoxide dismutase, catalase, and peroxidase activity.

19. An antioxidant composition comprising a salen metal complex of claim 1 ~~or claim 10~~ in a tablet, capsule, ampule, suppository, inhaler, or hypodermic syringe.

20. A method for inhibiting damage to cells induced by reactive oxygen species, the method comprising contacting cells having oxidative stress with a salen-metal complex of claim 1 ~~or claim 10~~.

21. A method for preventing, arresting, or treating a free radical-associated disease state by administering to a patient a therapeutically-effective dose of an antioxidant salen-metal complex pharmaceutical composition comprising an antioxidant salen metal complex of claim 1 ~~or claim 10~~.

22. A method of claim 21, wherein the salen-metal complex is selected from the group consisting of: C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44,

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C45, C46, C47, C48, C49, C50, C51, C54, C55, C56, C58, C67, C68, C71, C72, C73, C74, C76, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, and C94.

5           23. A method of claim 22, wherein the salen-metal complex is C32 or C40.

24. The use of a salen-metal compound according to claim 1 ~~or claim 10~~ having predetermined superoxide dismutase  
A 10 or catalase activity to treat or prevent disease.

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